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Open Cooperation for European mAritime awareNess

To demonstrate enhanced situational awareness in a maritime environment through integration of technologies for unmanned systems, CMS, naval communications and maritime operation centers.

Coordinator **Leonardo S.p.A.**
43 Participants - **15** countries
Project duration **2018 - 2021**
Total budget **35 480 000** €

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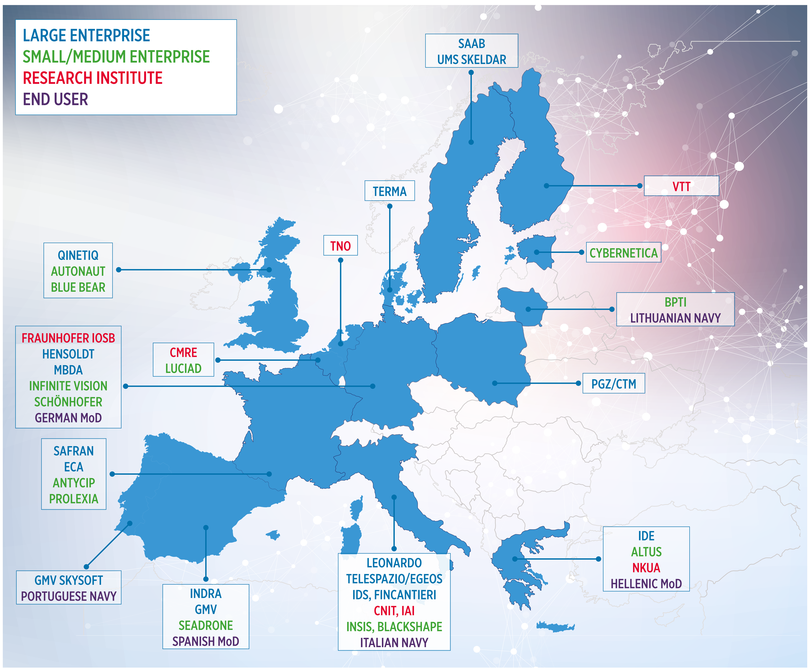
The Consortium



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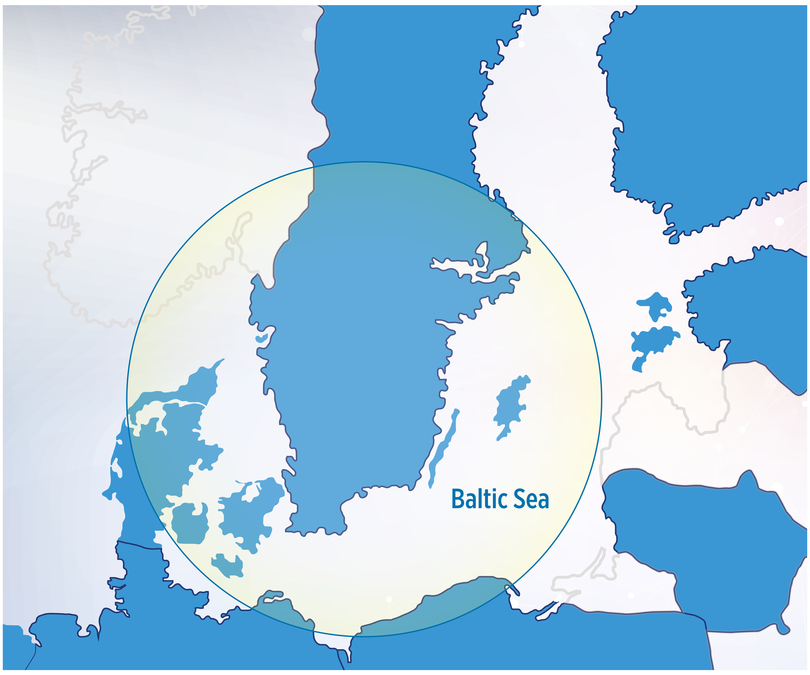
Second Sea Demonstration
25 - 26 August 2021
Hanö Bight



2 scenarios:

- High Speed Surface Threat
- Unknown submerged activity

4 Vessels
13 Unmanned systems
1 Earth Observation Satellite system
5 Tactical Command and Control Systems
1 Prototype of a EU Maritime Operations Centre

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SW-4 Solo

- Based on the proven SW-4 light single engine EASA certified helicopter, it has been designed as an Optional Piloted Vehicle to be used both in manned and unmanned missions to ensure maximum operational flexibility. ISTAR Mission, Manned-Unmanned Teaming and Data Dissemination capabilities have been already extensively demonstrated in real operational environment.

- The RUAS variant is capable of performing a large spectrum of civil and military roles including Disaster Relief, Law Enforcement, Combat Support, Intelligence, Surveillance Targeting and Reconnaissance (ISTAR) missions, both in Land and Maritime environments.

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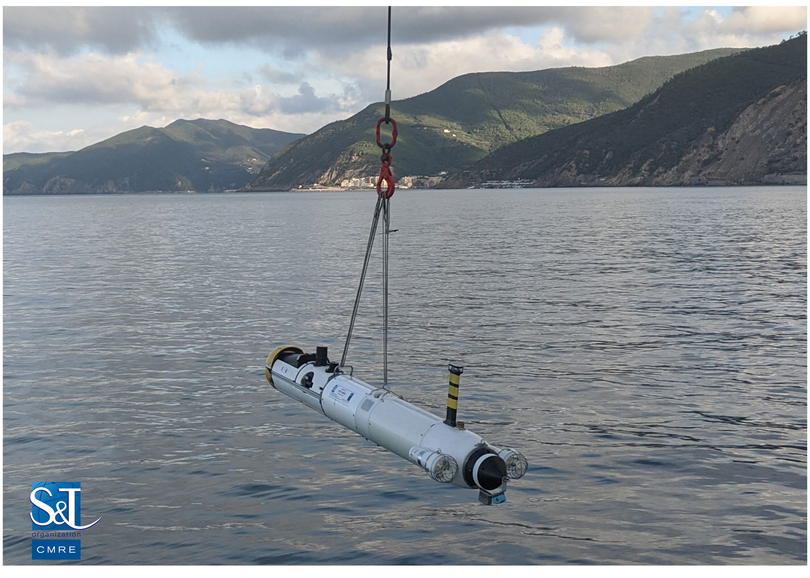
BIONDo

- The BIONDo Unmanned Underwater Vehicle is a hover-capable, small-diameter autonomous system employed as a research platform in the area of mine countermeasure research, particularly focusing on the employment of short-range, high-resolution acoustic sensors.

- BIONDo is based on the commercial Sparus II platform from IQUA Robotics (Girona, ESP), with additional forward-looking acoustic camera, high-grade inertial navigation system (INS), communications suite integrated by CMRE. BIONDo autonomy is based on CMRE research products, including onboard behaviours and multi-vehicle collaboration capabilities, all leveraging the open interface design of the native Sparus II platform.



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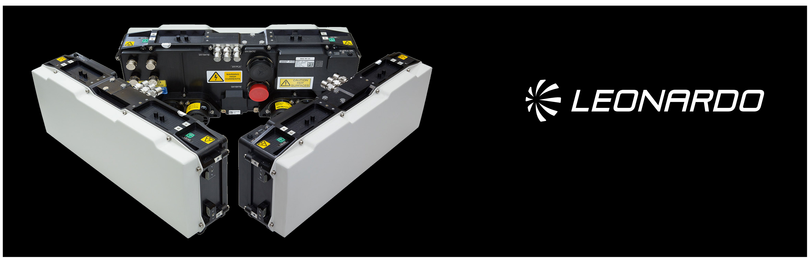
AESA Radars

The AESA Radar family of Leonardo contributes to the OCEAN2020 project with its OSPREY radar onboard Leonardo SW-4 Solo and SAFRAN Patroller, and the PicoSAR onboard UMS Skeldar V200.

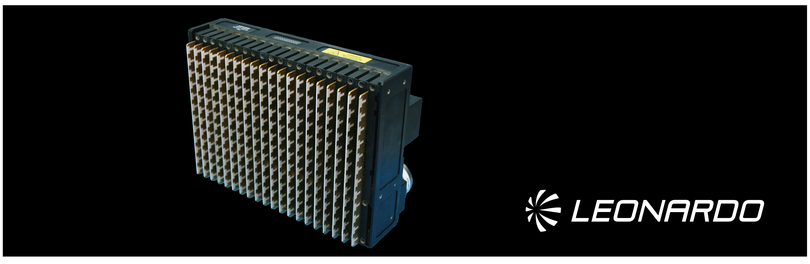
Osprey

- Class-leading multi domain surveillance capability
- Maritime wide area surveillance
- Patented small target detection – exceptional in high sea states and from high altitude
- Very high resolution SAR and MTI
- Instantaneous multiple mode interleaving



PicoSAR

- Very low SWaP
- Class leading SAR & MTI
- Easy to install
- Ideal for the UAV platform



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Patroller® Multirole UAS

- Designed for persistent ISR operations in land and maritime contexts, Patroller UAS owns a Type Certificate according to the airworthiness NATO STANAG 4671 standard. Patroller relies on 30 years experience of Safran Electronics & Defense in tactical UAS.

- Thanks to the best-in-class performances of its EO/IR and Multimode radar, Patroller UAS provides long range detection and identification without being detected.
  Patroller UAS complies with NATO interoperability standards, is easily deployable and requires no infrastructure to operate.

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Oceanscan

Oceanscan is a lightweight autonomous underwater vehicle, with sensors used to locate and identify mine-like objects. Fully autonomous and cooperative MCM (mine countermeasure) mission management software enables multiple Oceanscans to collaborate in a squad together with the Stingray Marine Searaider and other underwater vehicles such as the BIONDo owned by CMRE.

Stingray Marine Searaider

The Stingray Marine Searaider is a surface vehicle capable of autonomous waypoint navigation, which operates in the MCM (mine countermeasure) squad together with the Oceanscan underwater vehicles. The vessel is used for transport, launch and recovery of the Oceanscan and serves as a communication relay from underwater to surface to shore.

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Command and Control Systems

Five command and control systems are involved in the Baltic Sea Demonstration, integrating data from Aerial, Surface and Underwater Unmanned Systems and providing data fusion facilities:

- CMS 9LV (Saab) playing the role of Command of Task Group and integrating UAS Patroller, UAS Skeldar, USS Enforcer, USS Piraya, UUS Sea Wasp and USS Gavia
- CMS Guardion (Dutch Navy and TNO) managing a Mine Counter Measure (MCM) Squad and integrating UAS Solo, USS Sea Rider, USS Oceanscan, USS BIONDo and C2 Quasar
- C2 Quasar (Qinetiq) providing multiple control of Unmanned Systems (UAS Cobra and USS Autonaut)
- Experimental Planet C2 (IOSB) implementing shipborne command and control of Unmanned Systems and integrating USS Water Strider and UUS DeDave
- CMS Athena-C (Leonardo) enhancing the situation awareness of an operational Warship by integration of data and video from UAS SW-4 Solo

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Warship Integration

Three Warships and one Naval Research Ship are involved in the Baltic Sea Demonstration, supporting Unmanned Systems and demonstrating enhanced situation awareness:

- Zemaitis Patrol Vessel (Lithuanian Navy) demonstrating enhanced situation awareness through two Unmanned Aerial Systems, supporting operations of Special Forces and providing video streaming from shipborne EO sensor over satellite channel
- Czajka Mine Hunter (Polish Navy) supporting operations of an Unmanned Underwater System and demonstrating enhanced situation awareness through an Unmanned Aerial System
- Pelikan Torpedoes/Missile Recovering Ship (Swedish Navy) supporting operations of Unmanned Surface and Underwater Systems
- Planet Naval Resarch Ship (German MoD) supporting operations of Unmanned Surface and Underwater Systems, hosting shipborne command and control of Unmanned Systems

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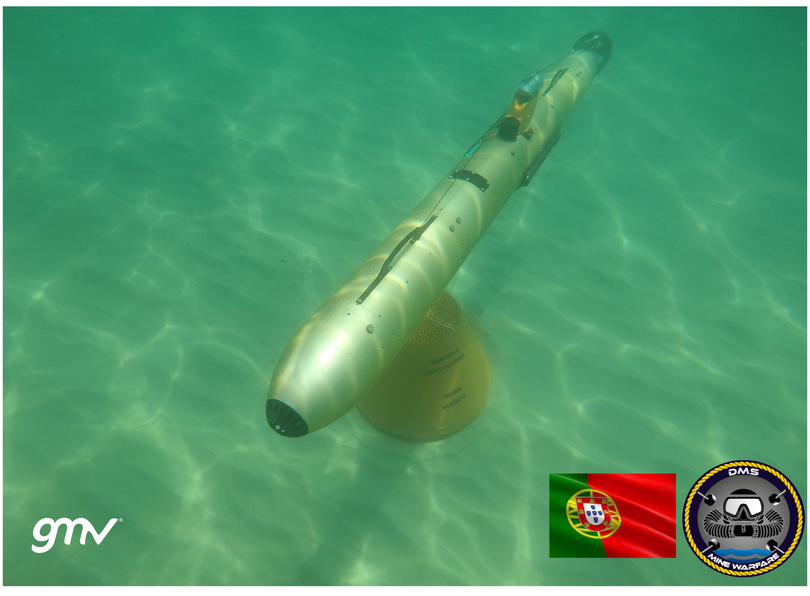
GAVIA

- The GAVIA System is an Underwater Autonomous Vehicle with modular construction, deployable by 2 persons. With an endurance of more than 8 hours, depth up to 200m and speed of more than 1,5 Knots, GAVIA key features also include high-accuracy survey-grade INS navigation with USBL and LBL aiding and chart-based graphical user interface.

- The GAVIA ground station was upgraded with an Automatic Target Recognition system to improve the accuracy of mine detection.



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Enforcer III

Enforcer III is a CB90 converted for development of unmanned surface vehicle functions. Designed for amphibious archipelago operation, Enforcer III is equipped for surface, air and underwater ISR.

Sea Wasp

Sea Wasp is designed to successfully locate, identify and neutralise IEDs, especially in confined areas and challenging conditions like strong current, ports and harbours.
Operated by as few as two people, the system can easily be configured to meet the requirements of any mission. Sea Wasp takes vessels and operators out of harms way, providing a safer underwater solution to ordnance disposal.

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Piraya

- Piraya is an unmanned surface vehicle for surveillance and reconnaissance. It has a robust and proven design and an extremely low logistics footprint.

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EU MOC (Maritime Operations Centre)

- Located at the European Defence Agency (EDA) facilities in Brussels, this centre acts as a node for the Mediterranean and Baltic Sea exercises, It processes data received from different national centres and deployed vessels and returns a much more accurate single common image of the situation at sea.

- The EU MOC offers a complete set of tools to support decision-making and enables real-time interaction with ships. The EU MOC has been designed as the basis on which to develop a European Military Command and Planning Capability in the future. Indra has led the development of the new European Maritime Operations Centre, in collaboration with Leonardo and IOSB.

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COBRA

- COBRA delivers an unrivalled on-demand ISR capability. It has been engineered to function in harsh environments, operate from sea level to high altitudes, carry highly capable payloads, have long endurance and be highly transportable.

- The system can be backpacked and launched from unprepared ground or even launched from a rail onboard a ship.

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AutoNaut

- The AutoNaut USV can perform over-the-horizon operation in hostile seas with very low visual and acoustic profile, with an endurance capability of multiple weeks.
- Sensors include passive digital array for ASW, RESM for EW and cameras for ISR.

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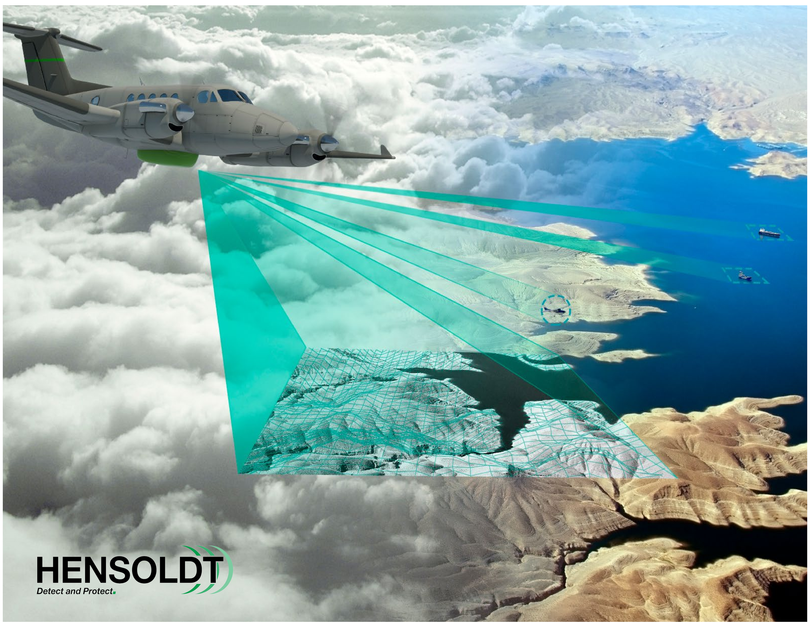
PrecISR ™

Airborne Multi-Mission Surveillance Radar

- PrecISR ™ has superior precision and target accuracy, with high detection performance and sensitivity even in strong clutter environment and ability to detect and track small targets in high sea swell.

- Key features also include 2-D E-scan capability allowing radar mode processing with track and verification beam and reduction of operator workload by automatic parameter setting. It is easy to install aboard helicopters, UAVs and fixed-wing special mission aircraft without fuselage penetration.



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DEDAVE

The DEDAVE is an autonomous underwater vehicle (AUV) with a length of 3.6m, height of 0.75m, and width of 0.95m. Its weight in air is 630 kg. The DEDAVE has an operational speed of 3.5 knots and an operational depth of 2000 m. With its large payload section the DEDAVE is a very flexible AUV deployable for a variety of missions.

Water Strider

Water Striders are low-cost unmanned surface vessels (USVs). They are equipped with GPS, a gimbal camera, WLAN mesh, and a Silvus radio. Due to a sophisticated electronics and intelligent algorithms they are able to operate as a swarm and to detect surface objects and keep them in the field of view of the camera. Water Striders travel at 2 – 4 knots in sea.

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